Meridian 1

ISDN Basic Rate Interface

Installation

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Revision history

January 2002

Standard 7.00. This document is up-issued to to include content changes for Meridian 1 Release 25.40.

April 2000

Standard 6.00. This is a global document and is up-issued for X11 Release 25.0x. Document changes include removal of: redundant content; references to equipment types except Options 11C, 51C, 61C, and 81C; and references to previous software releases.

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Standard version released for Generic X11 Release 18.00

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About this document

This document applies to Meridian 1 Internet Enabled systems.

This document is a global document. Contact your system supplier or your Nortel Networks representative to verify that the hardware and software described is supported in your area.

Note 1: For Option 11C specific information, refer to Option 11C Basic Rate Interface (BRI) (553-3011-311).

Note 2: ISDN BRI trunking is not available in North America.

Preinstallation preparation

Contents

The following are the topics in this section:

Prepare the site 9
Unpack and inspect 10
Take inventory 11

Reference list

The following are the references in this section:

- *Installation Planning* (553-3001-120)
- *System Engineering* (553-3001-151)
- *Power Engineering* (553-3001-152)
- *System Installation Procedures* (553-3001-210)
- *ISDN Basic Rate Interface: Product Description* (553-3901-100)

Prepare the site

When installing a system, address the following factors.

- environmental
- structural
- electrical

Refer to the following documents for more information.

- *Installation Planning* (553-3001-120)

- *System Engineering* (553-3001-151)
- *Power Engineering* (553-3001-152)

After the site has been planned, the following items must be completed prior to ISDN BRI installation.

- Wire the building between ISDN BRI terminal locations and the distribution frame. Refer to the "Engineering guidelines" section of *ISDN Basic Rate Interface: Product Description* (553-3901-100) for wiring specifications and guidelines. For the location of the terminals and the distribution frame, use the Building Cable Plan developed according to instructions in the "Planning the site" section in *Installation Planning* (553-3001-120).
- Install any IPE or Network Modules needed to house ISDN BRI cards as determined in "Engineering guidelines" of *ISDN Basic Rate Interface: Product Description* (553-3901-100). Refer to *System Installation Procedures* (553-3001-210) for a description of how to install the modules.

Unpack and inspect

ISDN BRI cards and external communication cables are shipped in separate packages. To unpack them, follow the general precautions recommended by computer and telephone equipment manufacturers.

- Remove items that generate static charge from the installation site.
- If the installation site is carpeted, spray it with an antistatic spray.
- Ground yourself before handling any equipment.
- Carefully remove the equipment from its packaging. Do not puncture or tear the containers. Use scissors or a utility knife.
- Inspect the equipment for obvious faults or damage. Report any damaged component to your sales representative and the carrier who delivered the equipment.
- When unpacking the circuit cards, hold them only by their non-conductor edges. Do not touch connector pins or components.

- Keep the circuit cards in their antistatic bags until you are ready to install them.
- Do not stack the plug-in cards on top of each other. This can damage the components and the printed circuits on the cards.

Take inventory

After unpacking, verify that all the equipment necessary is at the site before installation begins. Check the equipment received against the shipping documents. Note any shortages and report them to your sales representative.

Install ISDN BRI hardware

Contents

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Reference list

The following are the references in this section:

- *Meridian Communications Unit and Meridian Communications Adapter: Description, Installation, Administration, Operation* (553-2731-109)

- *ISDN PRI: Installation* (553-2901-201)
- *System Installation Procedures* (553-3001-210)
- *ISDN Basic Rate Interface: Product Description* (553-3901-100)
- *ISDN Basic Rate Interface: Administration* (553-3901-300)

Install ISDN BRI hardware for line applications

The following lists the procedures for installing ISDN BRI hardware for line applications. Meridian 1 must already be installed and operating according to the instructions in *System Installation Procedures* (553-3001-210) before performing these procedures.

For a successful installation, perform these procedures in the order listed below:

1 Select the card slots where the ISDN BRI cards will be located

2 Remove the module cover for card installation

3 Install the MISPs

4 Install the SILCs and/or UILCs or BRSCs

5 Connect ISDN BRI terminals. This procedure comprises the following:

— connect the Meridian 1 to the Main Distribution Frame (MDF)

— cross connect the MDF

— connect ISDN BRI terminals to the DSL

— initialize the ISDN BRI terminals.

———————— ***End of Procedure*** ————————

Select the card slots

To install ISDN BRI cards, perform the following steps:

1 Identify all the slots that can contain them. First identify the modules with unused network and peripheral card slots and then remove the covers from the identified modules. To identify the modules, use the following Print Programs. Table 1 lists the modules that can house ISDN BRI cards.

- LD 22 to print the system configuration and identify unused network card slots to install MISPs
- LD 20 to list unused IPE card slots to install SILCs, UILCs and BRSCs

Table 1
ISDN BRI card location

Modules	Supported Systems	SILCs, UILCs, BRSCs	MISPs
NT5D21 Core/Network Module	51C, 61C, 81C	—	Network slots 0-7
NT8D35 Network Module	81C	—	Network slots 5-12
NT8D37 IPE Module	All systems	IPE slots 0-15	—

2 Locate the card slots in the Meridian 1 modules which can house ISDN BRI cards. Group all SILCs, UILCs, BRSCs, superloops and the MISP that supports them in the same network group to avoid using junctors for dedicated connections.

The following rules apply when selecting the card slots:

MISPs

- MISPs are inserted into the CE/Network Module for options 51C and 61C, and the Network Module for options 81C. Refer to the LD 22 printout to identify modules with unused network card slots and to Table 1 for the card slots in these modules that can house MISPs.
- An MISP cannot share network loop addresses with a Superloop Network Card in options 51C, 61C, and 81C. The MISP requires two network loop addresses and one network card slot.
- An MISP supports a maximum of eight BRSCs and two line cards.
- An MISP supports a set of four SILCs or UILCs when not supporting a BRSC.
- An MISP can support both BRSCs and SILCs or UILCs at the same time. If it serves one BRSC, a MISP can also support three line cards. If it supports two or more BRSCs, a MISP can also support two line cards.

BRSCs

- Install one BRSC per IPE module.
- With a BRSC configured, an IPE module can support a maximum of 15 line cards. These may be up to eight UILCs combined with any other seven peripheral cards (including SILCs), or up to 15 SILCs.

SILCs/UILCs

- SILCs, UILCs and BRSCs are installed into the IPE card slots of the CE/PE Module and/or the IPE Module for option 21E. They are installed into the IPE Module for all other system options. Refer to the LD 20 printout to identify modules with unused peripheral card slots.

- In each module, install a maximum of 15 SILCs, or eight UILCs combined with any other seven peripheral cards (including SILCs). If 15 SILCs are installed, the remaining slots in the module may contain a BRSC, a UILCs or non-ISDN BRI cards that do not need the - 48 V power supply of the IPE module (this restriction is due to power supply limitations for the module). If 8 UILCs are used, you may install any other card which could reside in the IPE module.
- Group all SILCs, UILCs, BRSCs and the MISP that supports them in the same network group to avoid using junctors for dedicated connections. The figures that follow show typical module configurations.

  Figure 1 shows the NT8D35 Network module.

  Figure 2 shows the NT8D37 IPE module.

  Figure 3 shows the NT5D21 Core/Network module.

Figure 1
NT8D35 Network module

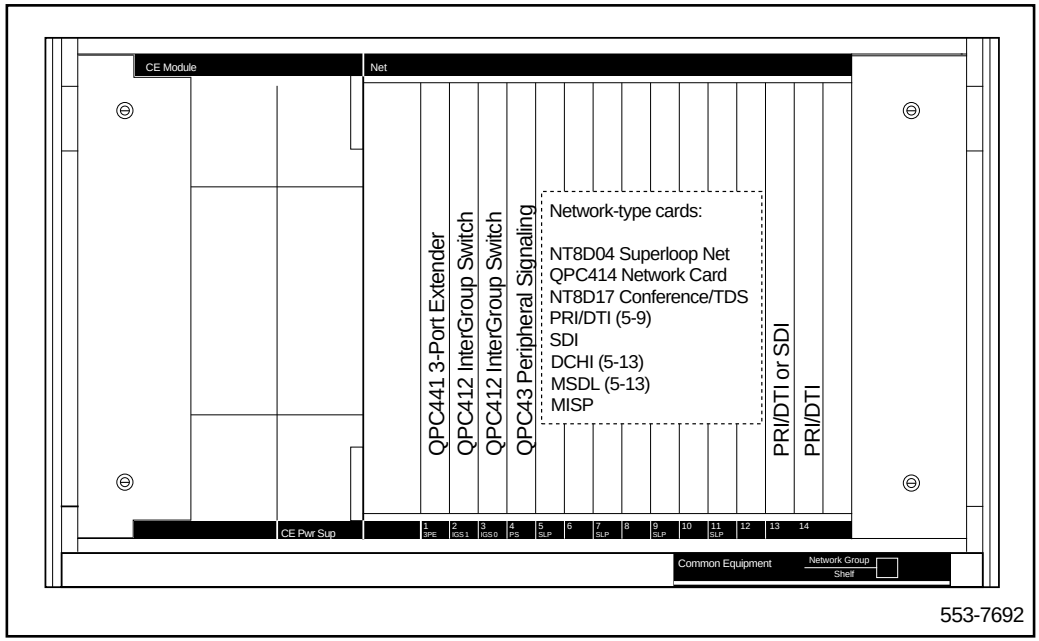


Figure 2
NT8D37 IPE module

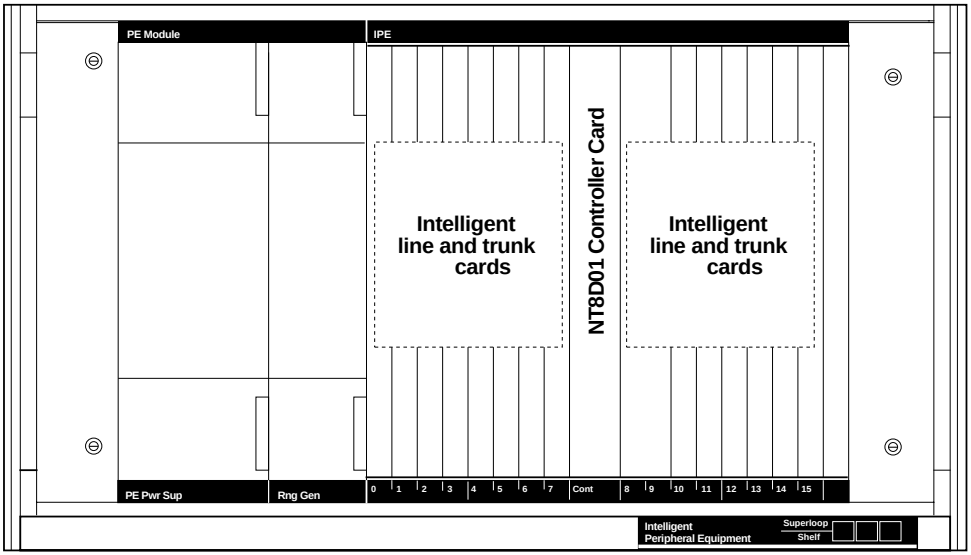
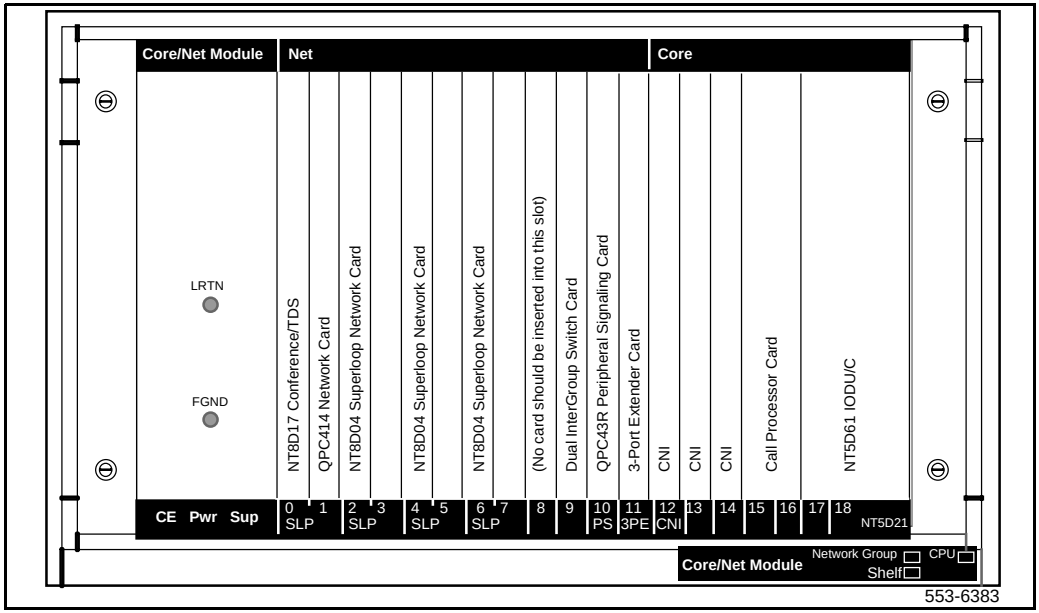


Figure 3
NT5D21 Core/Network module



Remove the module cover for card installation

To remove the covers from Meridian 1 modules with unused card slots, follow the procedure below. Refer to Figure 4.

1 Use a flat-blade screwdriver to unlock the left latch on the front of the cover by turning the screw 1/4 turn clockwise.

2 Use a flat-blade screwdriver to unlock the right latch on the front of the cover by turning the screw 1/4 turn counterclockwise.

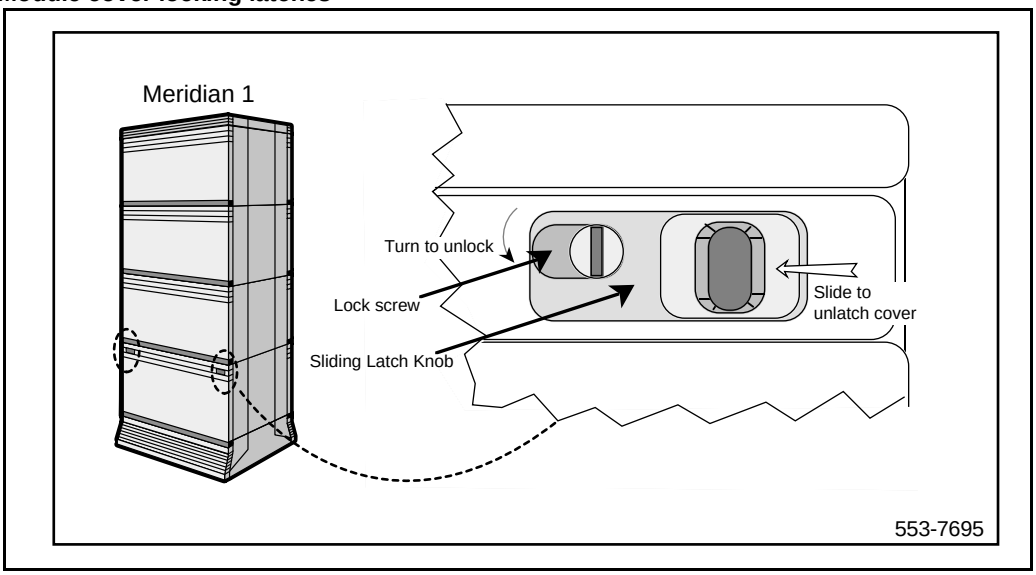
3 While holding the cover so it does not fall off, slide the latches toward the center of the cover.

4 Pull the cover toward you and lift it away from the module.

5 Place the cover in a safe place away from the working area to avoid damaging it.

6 Repeat steps 1 through 5 for each cover requiring removal.

Figure 4
Module cover locking latches



Install the MISP

Once covers have been removed and card slot locations selected for ISDN BRI cards, install the MISP cards.

1 Hold the MISP by its card-locking devices. Squeeze the tabs to unlatch the card-locking devices and lift the tabs out and away from the card.

2 Insert the MISP into the selected card slot of the module so it engages the card guides in the module.

3 Slide the MISP into the module until it engages the backplane connector.

4 Push the MISP firmly into the connector using the locking devices as levers by pushing them toward the card's front panel.

5 Push the tabs firmly against the front panel of the card so they latch to the front lip in the module and to the post on the card.

6 Observe the red LED on the MISP faceplate.

- If the red LED lights and stays lit continuously without flashing three times, the card is defective. Remove the MISP, choose a new MISP, and repeat the installation procedure.
- If the red LED lights, flashes three times, and turns off, the MISP is operating correctly and is configured and enabled. Go to step 7.
- If it lights, flashes three times, and stays lit continuously, the MISP is operating correctly but is not configured and enabled. Go to step 7.

7 Repeat steps 1 through 6 for each MISP requiring installation.

———————— ***End of Procedure*** ————————

Remove the MISP

1 Hold the MISP by its card-locking devices. Squeeze the tabs to unlatch the card-locking devices and lift the tabs out and away from the card.

2 Carefully remove the MISP from its card slot, and slowly slide out the card from the module.

———————— ***End of Procedure*** ————————

Install the BRSC, SILC and UILC

After MISPs are installed, install SILCs, UILCs and BRSCs, as required. As the cards are installed, keep a list of the card type (BRSC, SILC or UILC), the module number, and the number of the card slot containing the card. Use the CE/PE Module card location form or the IPE Module card location form at the end of this chapter to document this information.

1 Hold the card by its card-locking devices. Squeeze the tabs to unlatch the card-locking devices and lift them away from the card.

2 Insert the BRSC, SILC or UILC into the selected card slot of the module so it engages the card guides in the module.

3 Slide the BRSC, SILC or UILC into the module until it engages the backplane connector.

4 Push the card firmly into the connector using the locking devices as levers by pushing them toward the card's front panel.

5 Push the tabs firmly against the front panel of the card so they latch to the front lip in the module and to the post on the card.

6 Observe the red LED located on the faceplate.

- If the red LED turns on and stays lit continuously, the card is defective. Remove the card, choose a new card, and repeat the installation procedure.
- If it flashes three times and then turns off, the card is operating correctly. Go to step 7.
- If the red LED flashes three times and then stays lit continuously, the card is operating correctly but is not configured. Go to step 7.

7 On the CE/PE or IPE Module Card Location Form, fill in the card type and the module number next to the slot number of the installed card.

8 Repeat steps 1 through 7 for each card requiring installation.

End of Procedure

Remove the BRSC, SILC and UILC

1 Hold the card by its card-locking devices. Squeeze the tabs to unlatch the card-locking devices and lift them away from the card.

2 Carefully disengage the BRSC, SILC or UILC from the backplane connector, and slowly slide out the card from the module.

End of Procedure

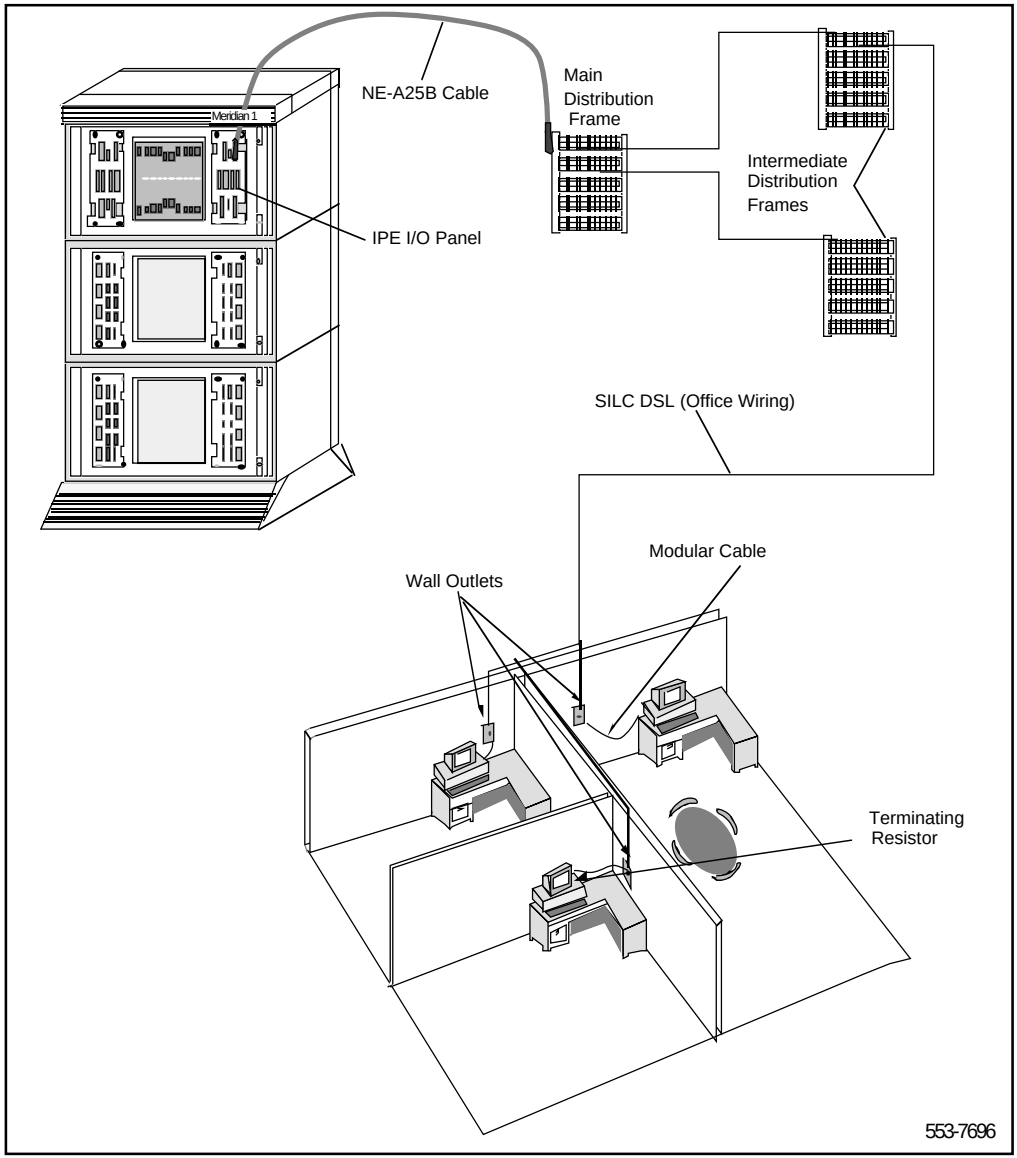
Connect ISDN BRI terminals to Meridian 1

Connecting the ISDN BRI terminals to the Meridian 1 consists of the following procedures.

- connect the Meridian 1 to the Main Distribution Frame (MDF)
- cross connect the MDF
- connect the ISDN BRI terminals to the DSL

Figure 5 shows a typical DSL with ISDN BRI terminals connected to it using modular cables.

Figure 5
Connect ISDN BRI terminals to Meridian 1



Connect Meridian 1 modules to the MDF

Meridian 1 modules connect to the MDF using NE-A25B cables with 50-pin D-type male connectors on each end. One end of the cable plugs into the I/O panel at the rear of the Meridian 1 module and the other end plugs into the MDF.

Figure 6 shows the cable connection between the Meridian 1 and the MDF.

1 Determine the number of NE-A25B cables needed to connect one module to the MDF.

2 Label each end of the cable specifying the module number, the connector name (A, B, C), and the card type (SILC or UILC).

3 Plug one end of a cable into the appropriate connector on the I/O panel at the rear of the Meridian 1 module. Plug the other end of the cable into the corresponding connector on the MDF.

4 Properly identify cables on the MDF. For example, plug the cable into connector A on the I/O panel and into the connector labeled A on the MDF if an SILC or UILC is installed in slot 0 of an IPE module.

5 Repeat steps 2 through 4 for all cables in that module.

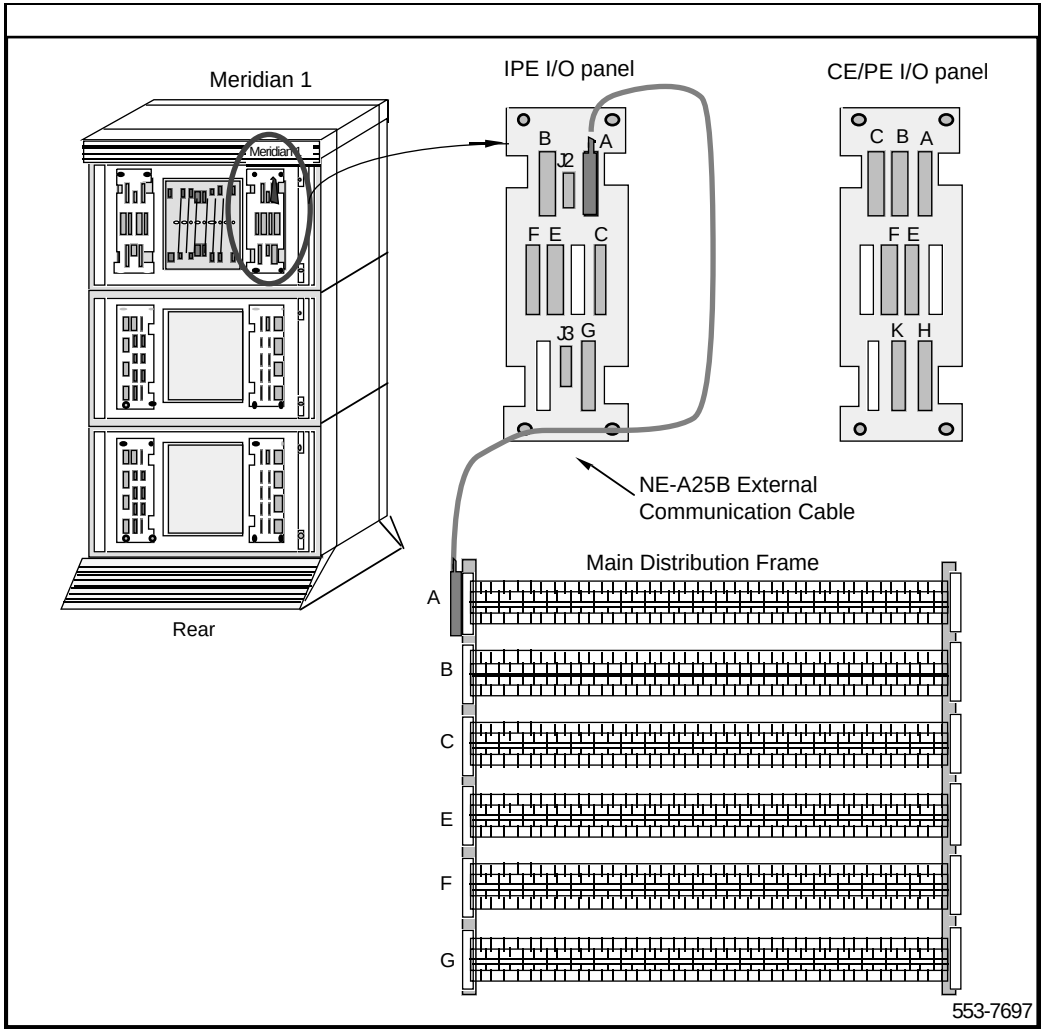
6 Repeat steps 1 through 5 for all modules containing SILCs and/or UILCs.

7 Lay all the cables neatly and fasten them with cable ties.

8 Label the MDF, as necessary, using Table 2 through Table 5.

———————— ***End of Procedure*** ————————

Figure 6
Connect the Meridian 1 to the MDF



SILC/UILC port designations at the MDF

The tables that follow provide SILC/UILC port designations at the MDF, for the NT8D37 IPE.

Table 2 shows the SILC port designation labels for the IPE Module. The UILC port designation labels for the IPE and CE/PE Modules is shown in Table 3.

Table 2
SILC port designations at the MDF: NT8D37 IPE Module (16-cable configuration) (Part 1 of 2)

0 A	T-T+R+R-0	T-T+R+R-1	T-T+R+R-2	T-T+R+R-3	T-T+R+R-4	T-T+R+R-5	T-T+R+R-6	T-T+R+R7		A
1 B	T-T+R+R-0	T-T+R+R-1	T-T+R+R-2	T-T+R+R-3	T-T+R+R-4	T-T+R+R-5	T-T+R+R-6	T-T+R+R7		B
2 C	T-T+R+R-0	T-T+R+R-1	T-T+R+R-2	T-T+R+R-3	T-T+R+R-4	T-T+R+R-5	T-T+R+R-6	T-T+R+R7		C
3 D	T-T+R+R-0	T-T+R+R-1	T-T+R+R-2	T-T+R+R-3	T-T+R+R-4	T-T+R+R-5	T-T+R+R-6	T-T+R+R7		D
4 E	T-T+R+R-0	T-T+R+R-1	T-T+R+R-2	T-T+R+R-3	T-T+R+R-4	T-T+R+R-5	T-T+R+R-6	T-T+R+R7		E
5 F	T-T+R+R-0	T-T+R+R-1	T-T+R+R-2	T-T+R+R-3	T-T+R+R-4	T-T+R+R-5	T-T+R+R-6	T-T+R+R7		F
6 G	T-T+R+R-0	T-T+R+R-1	T-T+R+R-2	T-T+R+R-3	T-T+R+R-4	T-T+R+R-5	T-T+R+R-6	T-T+R+R7		G
7 H	T-T+R+R-0	T-T+R+R-1	T-T+R+R-2	T-T+R+R-3	T-T+R+R-4	T-T+R+R-5	T-T+R+R-6	T-T+R+R7		H
8 K	T-T+R+R-0	T-T+R+R-1	T-T+R+R-2	T-T+R+R-3	T-T+R+R-4	T-T+R+R-5	T-T+R+R-6	T-T+R+R7		K
9 L	T-T+R+R-0	T-T+R+R-1	T-T+R+R-2	T-T+R+R-3	T-T+R+R-4	T-T+R+R-5	T-T+R+R-6	T-T+R+R7		L
10 M	T-T+R+R-0	T-T+R+R-1	T-T+R+R-2	T-T+R+R-3	T-T+R+R-4	T-T+R+R-5	T-T+R+R-6	T-T+R+R7		M
11 N	T-T+R+R-0	T-T+R+R-1	T-T+R+R-2	T-T+R+R-3	T-T+R+R-4	T-T+R+R-5	T-T+R+R-6	T-T+R+R7		N
12 R	T-T+R+R-0	T-T+R+R-1	T-T+R+R-2	T-T+R+R-3	T-T+R+R-4	T-T+R+R-5	T-T+R+R-6	T-T+R+R7		R
13 S	T-T+R+R-0	T-T+R+R-1	T-T+R+R-2	T-T+R+R-3	T-T+R+R-4	T-T+R+R-5	T-T+R+R-6	T-T+R+R7		S

Table 2
SILC port designations at the MDF: NT8D37 IPE Module (16-cable configuration)
(Part 2 of 2)

T 14	T-T+R+R-0	T-T+R+R-1	T-T+R+R-2	T-T+R+R-3	T-T+R+R-4	T-T+R+R-5	T-T+R+R-6	T-T+R+R7		**T**
U 15	T-T+R+R-0	T-T+R+R-1	T-T+R+R-2	T-T+R+R-3	T-T+R+R-4	T-T+R+R-5	T-T+R+R-6	T-T+R+R7		**U**

Note 1: For the SILC port designations shown in this table, substitute Tx- Tx+ Rx+ Rx- for every occurrence of T- T+ R+ R-.

Note 2: The cable pair designated Tx- Tx+ is the transmit pair. The pair designated Rx+ Rx- is the receive pair. An SILC port supplies 2 watts of power at -48 V (-40 V for international), simplexed over the transmit and receive pairs, where the transmit pair is negative with respect to the receive pair.

Table 3
UILC port designation labels at the MDF: NT8D37 IPE Module (16-cable configuration)
(Part 1 of 2)

A 0	TR 0		TR 1		TR 2		TR 3		TR 4		TR 5		TR 6		TR 7	**A**
B 1	TR 0		TR 1		TR 2		TR 3		TR 4		TR 5		TR 6		TR 7	**B**
C 2	TR 0		TR 1		TR 2		TR 3		TR 4		TR 5		TR 6		TR 7	**C**
D 3	TR 0		TR 1		TR 2		TR 3		TR 4		TR 5		TR 6		TR 7	**D**
E 4	TR 0		TR 1		TR 2		TR 3		TR 4		TR 5		TR 6		TR 7	**E**
F 5	TR 0		TR 1		TR 2		TR 3		TR 4		TR 5		TR 6		TR 7	**F**
G 6	TR 0		TR 1		TR 2		TR 3		TR 4		TR 5		TR 6		TR 7	**G**
H 7	TR 0		TR 1		TR 2		TR 3		TR 4		TR 5		TR 6		TR 7	**H**
K 8	TR 0		TR 1		TR 2		TR 3		TR 4		TR 5		TR 6		TR 7	**K**

Table 3
UILC port designation labels at the MDF: NT8D37 IPE Module (16-cable configuration) (Part 2 of 2)

9 L	TR 0		TR 1		TR 2		TR 3		TR 4		TR 5		TR 6		TR 7		**L**
10 M	TR 0		TR 1		TR 2		TR 3		TR 4		TR 5		TR 6		TR 7		**M**
11 N	TR 0		TR 1		TR 2		TR 3		TR 4		TR 5		TR 6		TR 7		**N**
12 R	TR 0		TR 1		TR 2		TR 3		TR 4		TR 5		TR 6		TR 7		**R**
13 S	TR 0		TR 1		TR 2		TR 3		TR 4		TR 5		TR 6		TR 7		**S**
14 T	TR 0		TR 1		TR 2		TR 3		TR 4		TR 5		TR 6		TR 7		**T**
15 U	TR 0		TR 1		TR 2		TR 3		TR 4		TR 5		TR 6		TR 7		**U**

Note: The cable pair designated TR is a 2B1Q full duplex U interface.

Cross-connect the MDF

The MDF cross-connects NE-A25B cables connected to SILC and UILC ports with building wiring connected to ISDN BRI terminals.

Each SILC provides eight four-wire full duplex ports. These ports are connected to building wiring to form DSLs. These ports are polarity sensitive. Signal polarity must be maintained along each loop.

Each UILC provides eight two-wire full duplex ports. These ports are connected to twisted pair building wiring to form DSLs. These DSLs are not polarity sensitive and, although it is recommended, it is not necessary to maintain signal polarity along each loop.

Figure 7 and Figure 8 illustrate, respectively, a cross-connection of an SILC port and an UILC port to the building wiring.

Cross-connect SILC and/or UILC ports to the building wiring

1 Identify the card type (SILC or UILC) for a connector on the MDF. Refer to the IPE or CE/PE module card location form, which shows the card type connected to each I/O panel connector.

2 Identify transmit and receive pairs on the top of the labeled distribution strip for the card type and module type you are connecting. To identify SILC or UILC ports and their pin numbers, refer to Tables 4 through 10, which follow the illustrations.

Note: In Tables 4 through 10, the cable pair designated T- T+ is the transmit pair and the pair designated R+ R- is the receive pair of the S/T interface. The cable pair designated T R is the Tx and Rx of the 2B1Q full duplex U interface.

3 Identify building wires connected to the bottom of the distribution strip. Refer to the Building Cable Plan, which identifies wires between distribution frames and wall outlets.

4 Plug in the terminating resistor (Part Number A0378866) at the appropriate location in each S/T DSL. See “Engineering Guidelines” in the *ISDN Basic Rate Interface: Product Description* (553-3901-100) for engineering rules and locations of terminating resistors.

Figure 7
Cross-connect the SILC port to the office wiring

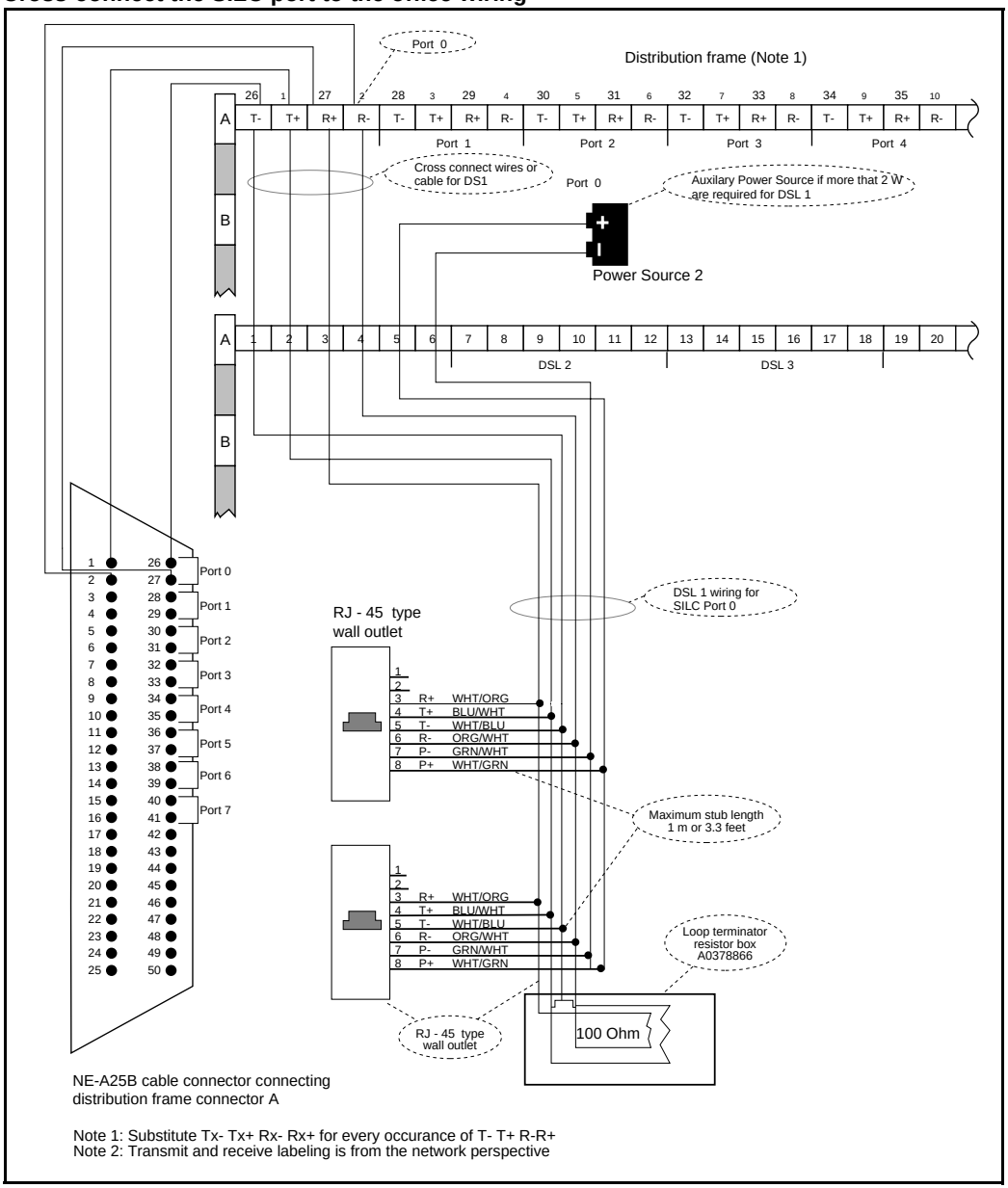

Port 0
Distribution frame (Note 1)
26 1 27 2 28 3 29 4 30 5 31 6 32 7 33 8 34 9 35 10
A
T- T+ R+ R- T- T+ R+ R- T- T+ R+ R- T- T+ R+ R- T- T+ R+ R-
Port 1
Port 2
Port 3
Port 4
Cross connect wires or cable for DS1
Port 0
Auxilary Power Source if more that 2 W are required for DSL 1
B
+
-
Power Source 2
A
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
DSL 2
DSL 3
B
1 26 Port 0
2 27
3 28 Port 1
4 29
5 30 Port 2
6 31
7 32 Port 3
8 33
9 34 Port 4
10 35
11 36 Port 5
12 37
13 38 Port 6
14 39
15 40 Port 7
16 41
17 42
18 43
19 44
20 45
21 46
22 47
23 48
24 49
25 50
RJ - 45 type wall outlet
DSL 1 wiring for SILC Port 0
1
2
3 R+ WHT/ORG
4 T+ BLU/WHT
5 T- WHT/BLU
6 R- ORG/WHT
7 P- GRN/WHT
8 P+ WHT/GRN
Maximum stub length 1 m or 3.3 feet
Loop terminator resistor box A0378866
RJ - 45 type wall outlet
100 Ohm
NE-A25B cable connector connecting distribution frame connector A
Note 1: Substitute Tx- Tx+ Rx- Rx+ for every occurance of T- T+ R-R+
Note 2: Transmit and receive labeling is from the network perspective

Figure 8
Cross-connect the UILC port to the office wiring

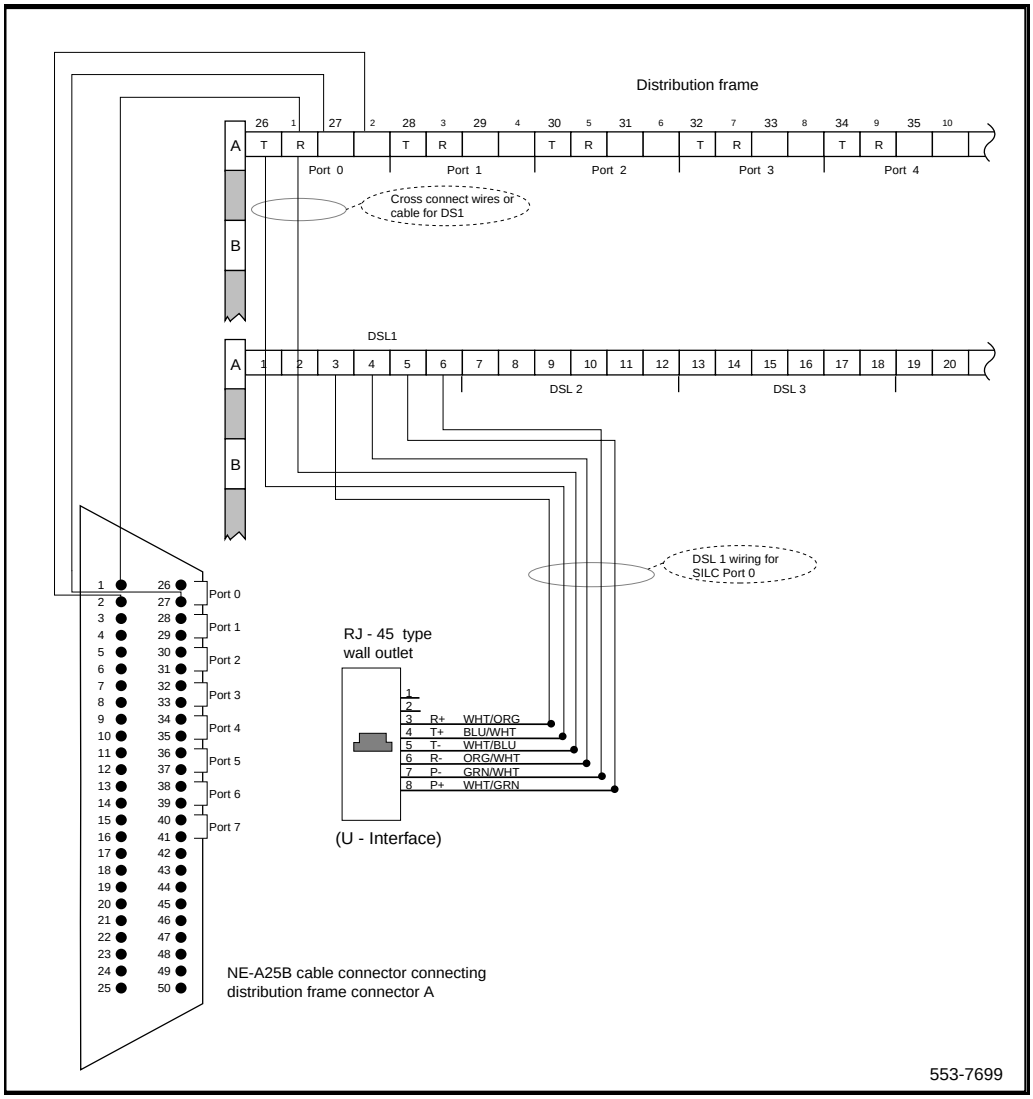


Table 4
NT8D37 IPE module
SILC and UILC pair-terminations for connectors A, E, K, R (12-cable configuration)

Port signals		Pairs	Pair color	I/O panel connectors				Card port
SILC	UILC			A	E	K	R	
0Tx - / 0Tx + 0Rx + / 0Rx -	0T / 0R	26 / 1 27 / 2	W-BL / BL-W W-O / O-W	slot 0	slot 4	slot 8	slot 12	0
1Tx - / 1Tx + 1Rx + / 1Rx -	1T / 1R	28 / 3 29 / 4	W-G / G-W W-BR / BR-W					1
2Tx - / 2Tx + 2Rx + / 2Rx -	2T / 2R	30 / 5 31 / 6	W-S / S-W R -BL / BL-R					2
3Tx - / 3Tx + 3Rx + / 3Rx -	3T / 3R	32 / 7 33 / 8	Rx-O / O-R R -G / G-R					3
4Tx - / 4Tx + 4Rx + / 4Rx -	4T / 4R	34 / 9 35 / 10	R-BR / BR-R R-S / S-R					4
5Tx - / 5Tx + 5Rx + / 5Rx -	5T / 5R	36 / 11 37 / 12	BK-BL / BL-BK BK-O / O-BK					5
6Tx - / 6Tx + 6Rx + / 6Rx -	6T / 6R	38 / 13 39 / 14	BK-G / G-BK BK-BR / BK-BR					6
7Tx - / 7Tx + 7Rx + / 7Rx -	7T / 7R	40 / 15 41 / 16	BK-S / S-BK Y-BL / BL-Y					7

Table 5
NT8D37 IPE module
SILC and UILC pair-terminations for connectors B, F, L, S (12-cable configuration)

Port signals		Pairs	Pair color	I/O panel connectors				Card port
SILC	UILC			B	F	L	S	
0Tx - / 0Tx + 0Rx + / 0Rx -	0T / 0R	26 / 1 27 / 2	W-BL / BL-W W-O / O-W	slot 1	slot 5	slot 9	slot 13	0
1Tx - / 1Tx + 1Rx + / 1Rx -	1T / 1R	28 / 3 29 / 4	W-G / G-W W-BR / BR-W					1
2Tx - / 2Tx + 2Rx + / 2Rx -	2T / 2R	30 / 5 31 / 6	W-S / S-W R-BL / BL-R					2
3Tx - / 3Tx + 3Rx + / 3Rx -	3T / 3R	32 / 7 33 / 8	R-O / O-R R-G / G-R					3
4Tx - / 4Tx + 4Rx + / 4Rx -	4T / 4R	34 / 9 35 / 10	R-BR / BR-R R-S / S-R					4
5Tx - / 5Tx + 5Rx + / 5Rx -	5T / 5R	36 / 11 37 / 12	BK-BL / BL-BK BK-O / O-BK					5
6Tx - / 6Tx + 6Rx + / 6Rx -	6T / 6R	38 / 13 39 / 14	BK-G / G-BK BK-BR / BK-BR					6
7Tx - / 7Tx + 7Rx + / 7Rx -	7T / 7R	40 / 15 41 / 16	BK-S / S-BK Y-BL / BL-Y					7
0Tx - / 0Tx + 0Rx + / 0Rx -	0T / 0R	42 / 17 43 / 18	Y-O / O-Y Y-G / G-Y	slot 2	slot 6	slot 10	slot 14	0
1Tx - / 1Tx + 1Rx + / 1Rx -	1T/ 1R	44 / 19 45 / 20	Y-BR / BR-Y Y-S / S-Y					1
2Tx - / 2Tx + 2Rx + / 2Rx -	2T / 2R	46 / 21 47 / 22	V-BL / BL-V V-O / V-O					2
3Tx - / 3Tx + 3Rx + / 3Rx -	3T / 3R	48 / 23 49 / 24	V-G / G-V V-BR / BR-V					3

Table 6
NT8D37 IPE module
SILC and UILC pair-terminations for connectors C, G, M, T (12-cable configuration)

Port signals		Pairs	Pair color	I/O panel connectors				Card port
SILC	UILC			C	G	M	T	
4Tx - / 4Tx + 4Rx + / 4Rx -	4T / 4R	26 / 1 27 / 2	W-BL / BL-W W-O / O-W	slot 2	slot 6	slot 10	slot 14	4
5Tx - / 5Tx + 5Rx + / 5Rx -	5T / 5R	28 / 3 29 / 4	W-G / G-W W-BR / BR-W					5
6Tx - / 6Tx + 6Rx + / 6Rx -	6T / 6R	30 / 5 31 / 6	W-S / S-W R-BL / BL-R					6
7Tx - / 7Tx + 7Rx + / 7Rx -	7T / 7R	32 / 7 33 / 8	R-O / O-R R-G / G-R					7
0Tx - / 0Tx + 0Rx + / 0Rx -	0T / 0R	34 / 9 35 / 10	R-BR / BR-R R-S / S-R	slot 3	slot 7	slot 11	slot 15	0
1Tx - / 1Tx + 1Rx + / 1Rx -	1T / 1R	36 / 11 37 / 12	BK-BL / BL-BK BK-O / O-BK					1
2Tx - / 2Tx + 2Rx + / 2Rx -	2T / 2R	38 / 13 39 / 14	BK-G / G-BK BK-BR / BK-BR					2
3Tx - / 3Tx + 3Rx + / 3Rx -	3T / 3R	40 / 15 41 / 16	BK-S / S-BK Y-BL / BL-Y					3
4Tx - / 4Tx + 4Rx + / 4Rx -	4T / 4R	42 / 17 43 / 18	Y-O / O-Y Y-G / G-Y					4
5Tx - / 5Tx + 5Rx + / 5Rx -	5T / 5R	44 / 19 45 / 20	Y-BR / BR-Y Y-S / S-Y					5
6Tx - / 6Tx + 6Rx + / 6Rx -	6T / 6R	46 / 21 47 / 22	V-BL / BL-V V-O / V-O					6
7Tx - / 7Tx + 7Rx + / 7Rx -	7T / 7R	48 / 23 49 / 24	V-G / G-V V-BR / BR-V					7

Connect the ISDN BRI terminals to the DSL

ISDN BRI terminals are connected to DSLs using modular cables up to 10 meters (33 feet) long, with RJ-45 plugs on each end. One end of the cable plugs into the terminal and the other end plugs into the wall outlet.

> ***Note:*** All ISDN BRI terminals should comply with CCITT, ANSI, ETSI NET-3, INS NET-64, National ISDN, 1TR6, Numeris VN2, and D70 standards for terminals, and be compatible with Meridian 1. For a list of compatible terminals, refer to the *ISDN Basic Rate Interface: Product Description* (553-3901-100).

Figure 9 illustrates a terminal connection to the S/T interface; Figure 10 illustrates a network termination (NT1) connection to the U interface.

1 Plug one end of the modular cable into the ISDN BRI interface connector on the terminal, and the other end of the modular cable into the wall outlet.

2 For an SILC S/T interface terminal with an optional auxiliary power source, plug the power source into the wall outlet, then plug the cable into the power source's RJ-45 jack. This power source must supply power only to the local ISDN BRI terminal, not back into the DSL through the RJ-45 wall outlet. The power adapter is supplied with the terminal.

3 Program the terminal parameters, such as the SPID and TEI, as required by the type of terminal. For detailed information pertaining to this procedure, refer to the section “Initialize ISDN BRI terminals”, found in *ISDN Basic Rate Interface: Administration* (553-3901-300).

4 Repeat steps 1 and 3 for each terminal to be connected.

———————————— ***End of Procedure*** ————————————

Connect the terminating resistors

DSLs require that a terminating resistor (Part Number A0378866) be connected at the end of each loop. See *ISDN Basic Rate Interface: Product Description* (553-3901-100), for engineering rules and locations of terminating resistors. The end of the S/T interface loop has a RJ-45 jack to plug in the telephone cable. Plug the terminating resistor into the RJ-45 and then plug the telephone cable into the terminating resistor. Note that for every port there is one loop with only one terminating resistor per loop. Each loop may have up to eight telephones.

Figure 9
Connect the ISDN BRI terminal to the S/T interface

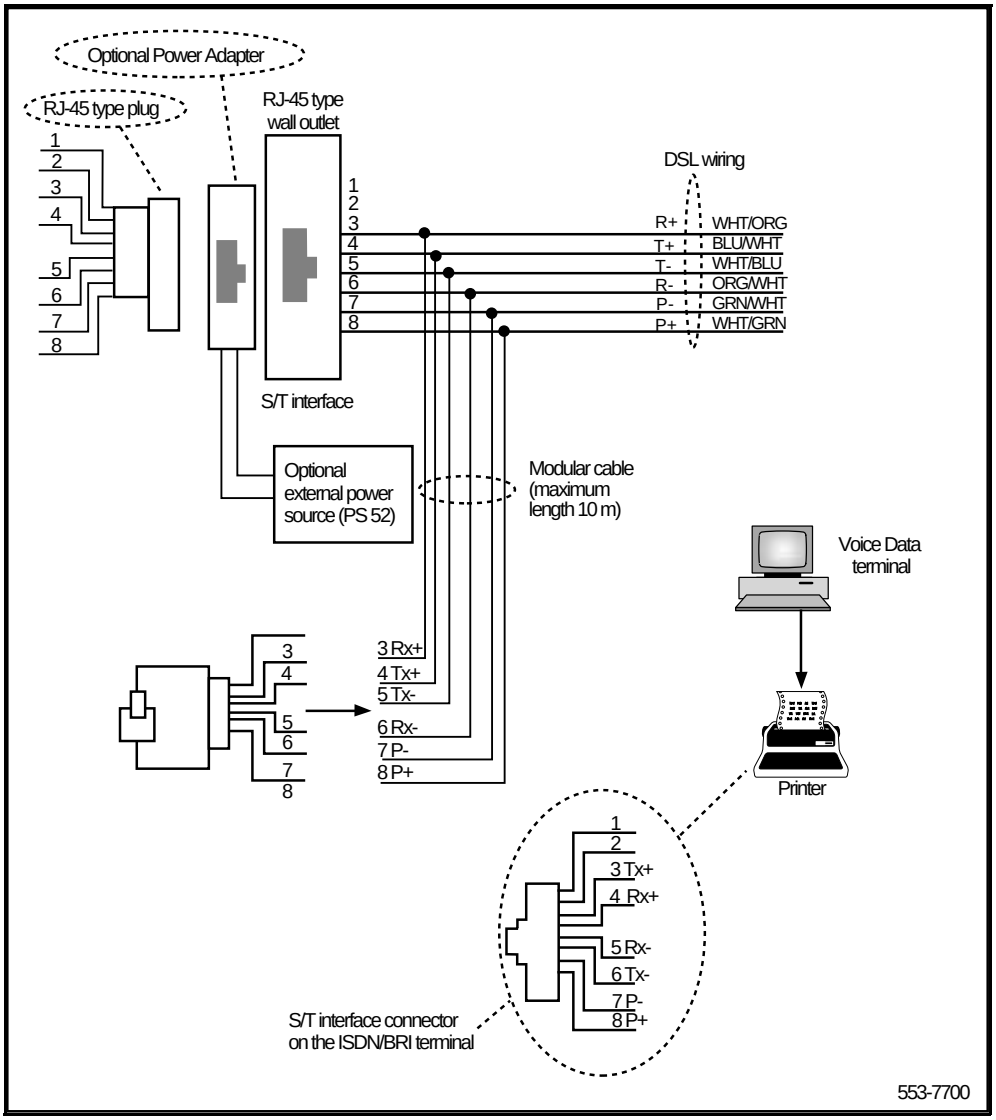
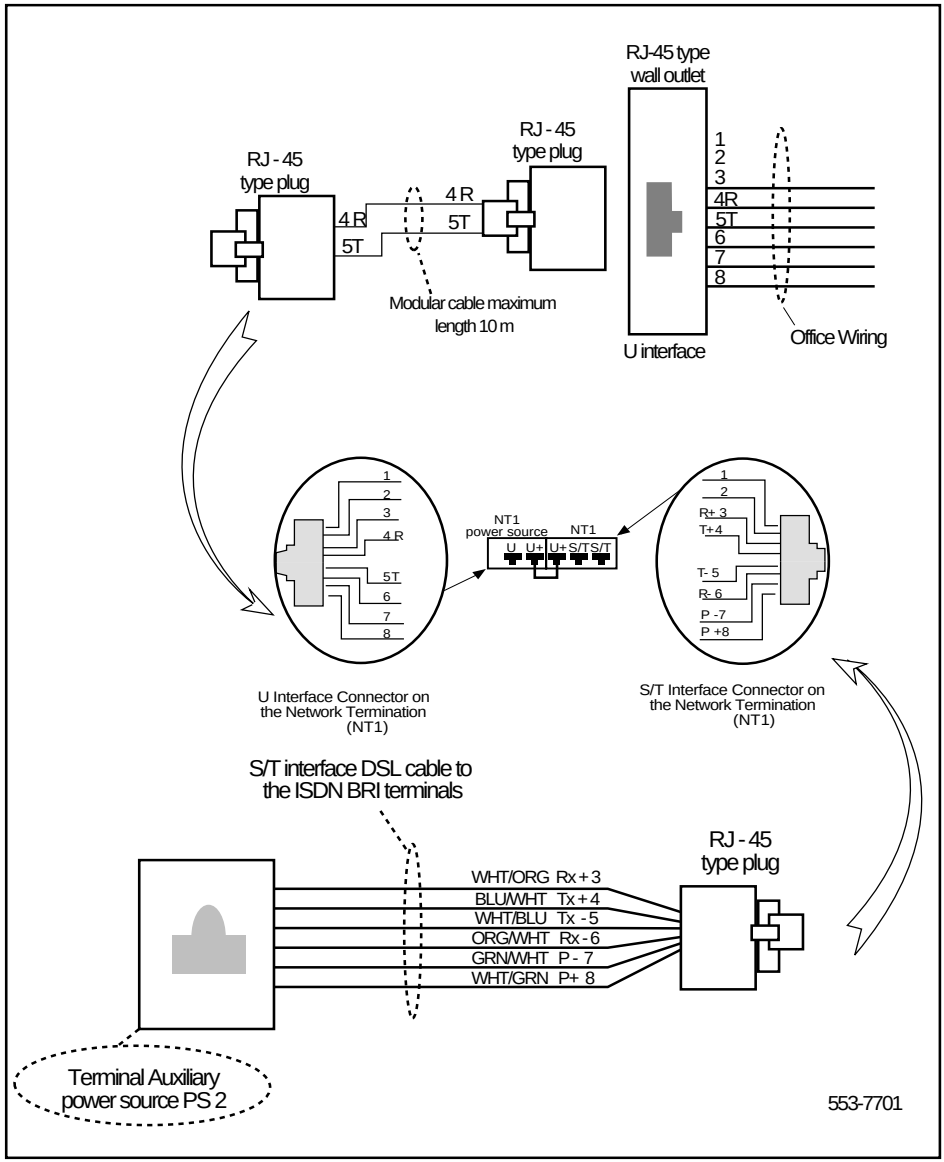


Figure 10
Connect the ISDN BRI network termination (NT1) to the U interface



Install ISDN BRI hardware for trunk applications

The following lists the procedures for install ISDN BRI hardware for ISDN BRI trunk applications. Meridian 1 must already be installed and operating according to the instructions in *System Installation Procedures* (553-3001-210) before performing these procedures.

For a successful installation, perform these procedures in the order listed below:

1 Select the card slots where the ISDN BRI cards will be located

2 Install the MISP

3 Install clock referencing on the SILC

4 Install the SILC and/or UILC

5 Connect Meridian 1 to the MDF

6 Cross-connect the MDF (in Terminal Equipment mode)

Note: The Meridian 1, in Tie trunk or CO connectivity, requires a different wiring configuration than for a line application; the transmit and receive pairs should be reversed, as illustrated in Figure 12.

Select the card slots

Follow the same procedures as described earlier for line applications (refer to “Select the card slots” on page 15).

Remove the module cover for card installation

Follow the same procedures as described earlier for line applications (refer to “Remove the module cover for card installation” on page 19).

Install the MISP

Follow the same procedures as described earlier for line applications (refer to “Install the MISP” on page 20).

Install the clock reference on the SILC

The DSL#0 and DSL#1 on an SILC card can be configured as the reference clock source, with DSL#0 being assigned for the primary clock reference and DSL#1 being assigned for the secondary clock reference.

The loop number and location of the primary and secondary clock source is configured in the Digital Data Block overlay 73. Refer to the *ISDN Basic Rate Interface: Administration* (553-3901-300).

The following procedure should be followed to provide clock referencing on the SILC.

Note: For procedures on how to install the QPC775/QPC471 Clock Controller on the various Meridian 1 systems, please refer to *ISDN PRI: Installation* (553-2901-201).

1 Maintain the same polarity on each transmit and receive. Rewire the selected Tx and Rx pairs (applicable to DSL0 and DSL1), to exchange the Tx and Rx pair position. This rewiring is done at the Main Distribution Frame (MDF).

2 Remove the phantom power jumpers (two jumpers per DSL) from the pin headers.

3 Place the SILC in the selected IPE slot.

4 Configure the selected DSL as TE mode (in overlay 27).

5 Enable the clock in overlay 60, to output the clock references to the IPE back plane pins.

6 Configure the Clock Controller card to accept ISDN BRI clock reference.

7 Check the appropriate messages from the Clock Controller to ensure that it is synchronized to the proper clock reference (this is done using overlay 60).

8 Connect the ISDN BRI clock reference cables to the Clock Controller, using the procedures which follow.

———————— ***End of Procedure*** ————————

Connect clock reference cables

The following procedure should be followed to connect the ISDN BRI clock reference cables to the Clock Controller. There are three different cables that route clock signals from the IPE back plane to the Clock Controller face plate (as shown in Figure 11). These are shown in Table 7.:

Table 7
ISDN BRI clock reference tables

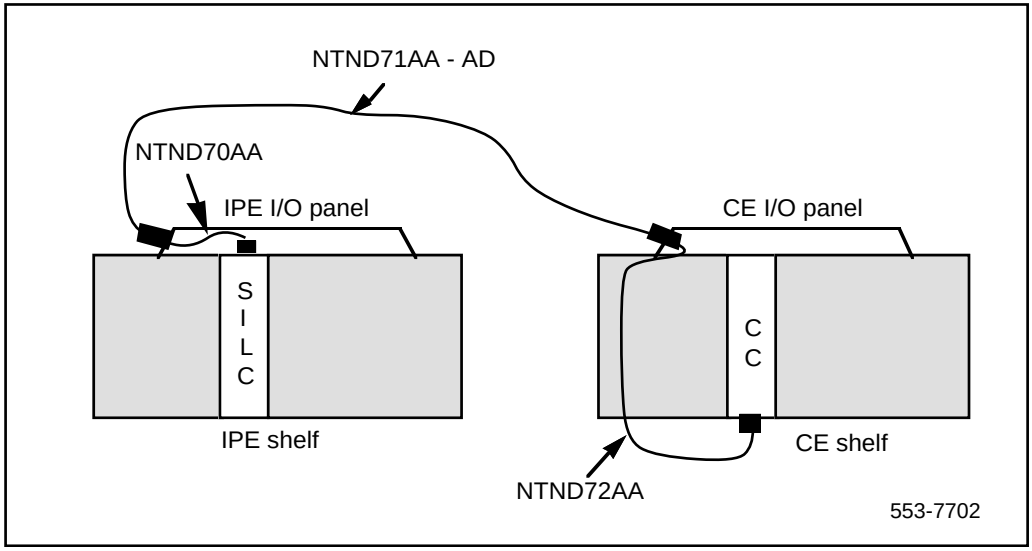
Code	Length (feet)	Use
NTND70AA	1.5	Connects IPE back plane to IPE I/O panel.
NTND71AA-AD	6.5, 12, 25, 42	Connects IPE I/O to CE I/O panel.
NTND72AA	6.5	Connects CE I/O to Clock Controller face plate.

Note: Measure the distance between the IPE and CE modules to ensure that you order the correct cable lengths.

1 Search for available D-sub 9 connector slots on the I/O panels of the selected IPE and CE I/O modules (if the I/O panel is equipped with D-sub 9 connector slots). If none is available, look for an empty slot used for 25 pair wire connectors (the cables contain two adapter plates to convert an 25 wire slot to two D-sub 9 connector slots).

2 Connect the cables as shown in Figure 11; if choosing IPE slots 0, 4, 8, or 12 the transmit and receive cable installed on pins 72 - 79 should be removed and secured to a proper place.

Figure 11
Clock reference cable connection



Clock recovery

The SILC is configured in the slave-slave mode when acting as a trunk interface. This is set up through the Maintenance Signaling Channel (MSC). The microcontroller configures the S/T chips on the SILC as appropriate.

The SILC may recover the network clock from the received data stream using on-chip phase lock loops. The clock frequency which is recovered is 2.56 MHz. The jitter and wander conform to CCITT recommendations.

All of the S/T chips on the SILC could be configured as Terminal Equipment Slaves (TES), but only the clocks recovered from DSL0 and DSL1 are routed to the back plane connector pins. These clocks are provided as differential pairs on back plane pins, as follows: in

Table 8
Clocks as differential pairs

Differential pairs	Pin #	Row A	Row B
Primary	73	+Ref 0A	- Ref 0A
Primary	74	+Ref 1A	- Ref 1A
Secondary	75	+Ref 0B	- Ref 0B
Secondary	76	+Ref 1B	- Ref 1A

Automatic clock recovery is done upon the expiration of the free run guard timer. Tracking is restored to the primary reference clock, if defined. If the primary reference clock is disabled, tracking is restored to the secondary reference clock, if defined.

Install the SILC and the UILC

Follow the same procedures as described earlier for line applications (refer to “Install the BRSC, SILC and UILC” on page 21).

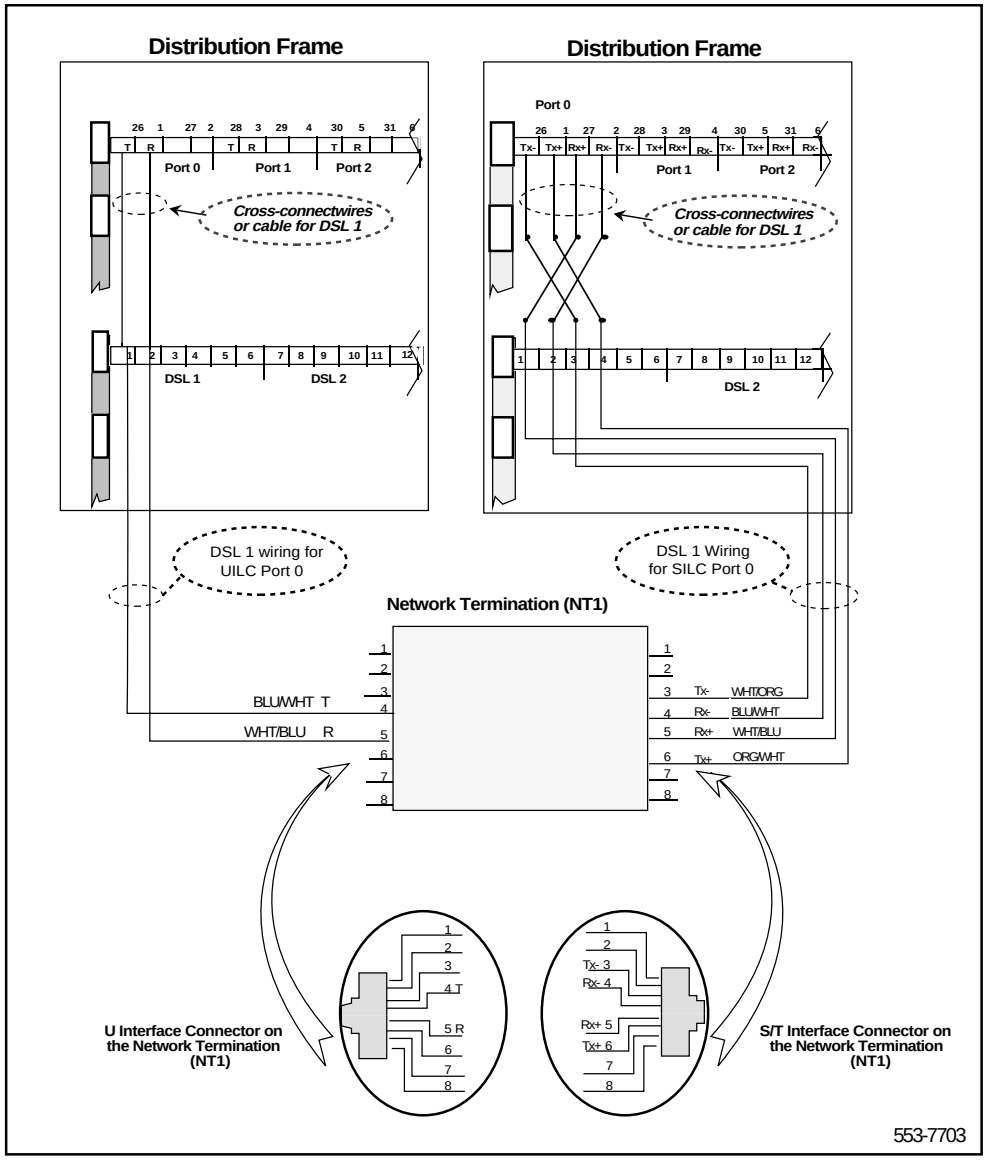
Connect Meridian 1 to the Main Distribution Frame (MDF)

Follow the same procedures as described earlier for line applications (refer to “Connect Meridian 1 modules to the MDF” on page 24).

Cross-connect the Main Distribution Frame (MDF)

The Meridian 1, in Tie trunk or CO connectivity, requires a different wiring configuration than for a line application; the transmit and receive pairs should be reversed, as illustrated in Figure 12.

Figure 12
Connect the network termination to the U interface and to the S/T interface (in TE mode)



Card location forms

The following card location forms may be used when installing SILC/UILC and BRSC cards on the Meridian 1.

Table 9
Card location form: NT8D37 IPE Module (16-cable configuration)

Card type (SILC/UILC/BRSC)	IPE Module number	IPE Module slot number	I/O panel connector	SILC/UILC/BRSC ports
		0	A	0–7
		1	B	0–7
		2	C	0–7
		3	D	0–7
		4	E	0–7
		5	F	0–7
		6	G	0–7
		7	H	0–7
		8	K	0–7
		9	L	0–7
		10	M	0–7
		11	N	0–7
		12	R	0–7
		13	S	0–7
		14	T	0–7
		15	U	0–7

Table 10
Card location form: NT8D37 IPE Module (12-cable configuration)

Card Type (SILC/UILC or BRSC)	IPE Module number	IPE module slot number	I/O panel connector	SILC/UILC or BRSC ports
		0	A	0–7
		1	B	0–7
		2	B C	0–3 4–7
		3	C	0–7
		4	E	0–7
		5	F	0–7
		6	F G	0–3 4–7
		7	G	0–7
		8	K	0–7
		9	L	0–7
		10	L M	0–3 4–7
		11	M	0–7
		12	R	0–7
		13	S	0–7
		14	S T	0–3 4–7

Meridian 1

ISDN Basic Rate Interface

Installation

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